

## In Conclusion:

There is a need for continued study on the effectiveness and ecological effects of shaded fuel breaks and other types of forest treatments. There are direct benefits that can be seen immediately after construction. For example, thinning opens the canopy, making water or retardant drops in front of an active fire more effective, and suppression efforts easier. However, the long term effects of thinning still are not completely understood. How are shaded fuel breaks changing the forest environment and what are the fire behavior trade-offs? Which treatment is the most effective in reducing fire danger for the least cost?



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## Boreal Forest Shaded Fuel Break Demonstration Sites



## What is a shaded fuel break?

It is an area of defensible space where the tree density is reduced to decrease the risk of catastrophic wildfires and extreme fire behavior around communities and structures.

## Why are they important?

Wildfire is an integral part of forest ecology in Alaska. Almost 80% of the population lives in areas potentially at risk from wildland fires.

This risk continues to grow as communities encroach on the Wild-land Urban Interface and spread into isolated locations surrounded by very flammable black spruce forests. As development continues in forested areas, it will become increasingly difficult to provide protection from property loss and damage due to wildfire. To combat this problem, hazard reduction projects, such as shaded fuel breaks, have been implemented in the interior and southcentral Alaska regions. Monitoring studies are important to assess the effectiveness of different treatments.



## Project Objectives:

To develop shaded fuel break demonstration sites to compare effectiveness, environmental effects, and the cost of four different hazard fuel treatments.

## Demonstration Sites

There are three demonstration sites where the public can view fuel break alternatives:

- On Ft. Wainwright, outside of the gated area, near Fairbanks, Alaska
- Toghotthele Corporation land ten miles north of Nenana
- Delta Bison Range, located thirty-five miles southeast of Delta Junction

Each site includes four different 1-acre thinning treatments and a control.

- 8 ft x 8 ft spacing
- 10 ft x 10 ft spacing
- 8 ft x 8 ft, pruned
- 10 ft x 10 ft, pruned
- Control (unmodified area)



Four treatment plots at Ft. Wainwright site

## Data Collection

Measurements include: tree density, canopy cover, tree diameter, canopy and “ladder” fuel heights, under-story vegetation cover, depth to permafrost, dead and down woody fuels, depth of forest duff layers, and weather data.



Weather Station in Delta control plot.

## To be Determined:

- Cost of operations
- Change in vegetation cover
- Effects on permafrost
- Changes in duff moisture
- Microclimate changes
- Changes in fire behavior
- Reduction in hazard fuel load

## Preliminary Results:

Thinning reduced tree densities by 72% to 95%. Forest floor moss and duff were significantly drier in the thinned areas. Average wind speed was slightly higher (about 1 mph) in the 10 x 10 pruned treatment than in the control between 1 and 6 pm, and relative humidity was also 1% higher. Temperature, however, was about 0.5° F cooler in the treatment. Fire behavior models predicted a fire in a thinned area would spread twice as fast on a hot day but potential “crownfire” behavior was decreased by 80%. The cost of thinning, pruning, and slash removal ranged between \$2,000-\$3,800/acre.



Dead surface vegetation in thinned plot at Ft. Wainwright site.